Instructions For

Numeric Keypad for the VIC-20™ and C-64™ Computers

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CK1/IB (11-83)

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CARDKEY/1 - INSTRUCTION MANUAL
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CK/1 KEYPAD INSTRUCTION MANUAL
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INTRODUCTION
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Your CK/1 Keypad can be used for several purposes in addition to entering numbers:

* By using the enclosed programs, you can use your computer and keypad as a 1Ø-key calculator with memory. You can even print the numbers on a printer and see the running totals.

* By using the enclosed KBASIC program, you can define the keypad keys to be any characters or words you desire. By defining the keys as BASIC or FORTH language statements, you can enter programs faster and easier; you'll also have fewer of those pesky typing errors.

* You could also define the keys as words, stock numbers, and so on for use in data-entry or menu-driven programs. In fact, the uses of the CK/1 Keypad are as unlimited as your imagination!

WHAT'S IN THE BOX?
****

The CK/1 Keypad comes with a cassette containing four programs. Two are for the VIC-2Ø(tm) and two are for the Commodore 64(tm). Those for the VIC are stored on one side and are named:

* KBASIC-VIC
* CARD/CALC-VIC

The C-64 programs are stored on the other side and are named:

* KBASIC-C64
* CARD/CALC-64

The KBASIC program is used to define the keypad key values. The KBASIC program also loads a machine-language program into memory (invisible to you!) which accepts input from the keypad. (This is necessary because the keypad is plugged into the joystick port.) You can define a set of key values and store them in a file; by doing this, you can have different sets, depending on what you are doing (entering numbers, programming in different languages, or responding to program prompts.)

The KBASIC program let you create a new set of key values or load a set previously stored in a file. By being able to store sets, you don't have to redefine the set every time you want to use it. Instead, you just run KBASIC and load the set you want.

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After you define or load the set of key values, you tell KBASIC to stop. It loads the machine-language program into memory, then removes itself from memory. You can then load and run another program which uses input from the keypad, or you can enter a program by using the redefined keys. For details on using KBASIC, go to the "USING KBASIC" section of this manual.

The other enclosed program, CARD/CALC, is used to make the computer a four-function calculator with memory. To use the CK/1 Keypad for CARD/Ct use the numbers on the top row of the keyboard rather than the keypad. The program lets you print the numbers you enter as well as the running total. You can also choose whether to use fixed-point numbers (two decimal places, like for money calculations) or floating-point numbers (up to nine decimal places). One handy feature (an improvement over electronic calculators!) is that the memory contents are displayed; you don't have to try to remember what is stored in memory. For details on using CARD/CALC, go to the "USING CARD/CALC" section of this manual.

KEYPAD ADAPTER (NOT IN THE BOX)

Although the KBASIC program will allow the CARDKEY/1 to work with most programs, to use the keypad with some programs (mostly those on cartridges) you may have to use the CARDCO CK/1A Keypad Adapter. This adapter (available from CARDCO, Inc. customer service) plugs directly into the computer's keyboard lines, so that the keypad looks like the keyboard to the computer. One thing to remember is that when the adapter is used, the key definitions are those printed on the keys (Ø,1,2,+,-,etc); the keys can not be redefined as BASIC statements or other symbols. The adapter, therefore, should be used only when the keypad is used for entering numbers.

No special tools or equipment are required to install the adapter. It is available from CARDCO, Inc. To order the adapter, use the order form in the back of this manual. (The computer's cover must be removed to install the adapter; this may void your Commodore factory warranty.)

SETUP

If you are going to use the CK/1A Keypad Adapter, follow the installation instructions that come with it. Otherwise, perform the following steps. You'll need to do this each time you want to use the keypad after the computer has been turned off and back on or after you reset the computer.

If you have any problems with the keypad or programs, please contact our Customer Service department at (316) 267-6525 Monday-Friday, 1:ØØpm-5:ØØpm central standard time.

1. Unplug any joysticks or game paddles if you are using any, then plug the keypad into the joystick port. (It's the one on the right end of the computer, labeled "Control Port"on the VIC, or "CONTROL PORT 2" on Commodore/64.

2. Load the cassette enclosed with the keypad. One side contains programs for the VIC-2Ø, and the other side contains programs for the Commodore 64. Make sure the side containing your computer's programs is facing up. Rewind the tape if necessary.

3. Enter LOAD to load the KBASIC program. This program lets you set the key values and accepts keypad input.

4. When READY is displayed, enter RUN to start the program.

5. Run the KBASIC program as directed in the "USING KBASIC" section of this manual.

6. When you are done with KBASIC, it removes itself from memory. You then use the keypad as follows.

* To use the calculator program on the enclosed cassette, enter LOAD to load it. When READY is displayed, enter RUN. You then run it as described in the "USING CARD/CALC" section of this manual.

* To use the keypad for input to a program, remove the keypad program cassette, then load the required cassette or diskette, then load and run that program. Input data to the program by pressing keys on the keypad.

* If you redefine the keys as program language statements, just start programming by entering line numbers (if any are used), then pressing keypad keys for statements and entering variable names and other parts of your program. Be sure to remove the keypad program cassette before SAVEing your program to cassette! (The Appendix of this manual shows a sample session where aBASIIC program is entered by this method.)

7. When you are finished using the keypad, you can leave the machine-language program in memory if you want. To remove it, just turn your compuer off and back on. If you do remove the program, though, you must run KBASIC again to use the keypad again.

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USING KBASIC
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The KBASIC program lets you define the values of the keypad keys and loads a machine-language program that reads the keypad input. You must run KBASIC before you can use the keypad.

After you define a set of key values, you can store them in a file on diskette or cassette. Then, whenever you run KBASIC again, you can load the set without having to redefine it. In fact, you can create different sets of key values, as many as you desire. You could have one of BASIC statements, one of FORTH statements, one for a menu-driven program, and so on.

After you create (or load) the key values and enter E to enable the machine-language program, KBASIC removes itself from memory. The machine-language program requires only about 324 bytes of memory, so you don't lose much memory by running it. The KBASIC program can be run on a VIC-2Ø with any amount of memory and on any Commodore 64. Two versions of KBASIC are stored on the enclosed cassette. One, named KBASIC-VIC, is for the VIC-2Ø; the other, named KBASIC-C64, is for the Commodore 64. Be sure to run the right one for your computer; otherwise, you'll end up with a blank screen and a locked keyboard!

To run the KBASIC program, perform the following steps: (An example of running KBASIC is shown in the Appendix.)

1. Plug in the keypad, then load the cassette containing the KBASIC program. Make sure the side containing your computer's version is facing up. Rewind the tape if necessary.

2. Enter LOAD to load the program.

3. You should only have to complete this step the first timeyou use KBASIC. This step will create a permenant backup copy of the program on disk or tape.

If you are using a disk system and you want to store this program on disk you should do so now. Place a disk with at least 20 block of free space in your disk drive then:

TYPE: SAVE"KBASIC",8 <RETURN>

From this point foreward, you may recall the program from the disk.

If you are using a cassette system you must now make a master cassette backup of the "KBASIC program.

Place a blank cassette in your cassette drive.

Rewind the cassette to the beginning.

TYPE: 15Ø6 OPEN2,1,Ø,N$ <RETURN>

TYPE: 15Ø8 <RETURN>

TYPE: 4Ø2Ø OPEN2,1,1,N$ <RETURN>

TYPE: SAVE"KBASIC" <RETURN>

You may want to store the CARD/CALC program next on this tape so leave the rest of this tape blank if you do. Instructions for saving CARD/CALC are contained in that section of this manual.

4. Enter RUN to start the program.

5. When the program is started, it displays a map of the keypad and three other lines. Because that screen rolls up after a few seconds, we are hereby presenting that screen in Figure 1. The SYSnnnn line is the instruction to enter to restart the machine-language program after you press RUN/STOP and RESTORE. Write down that instruction for possible later use.

SYS 40686
SYS 32494 w/ Simons

```
---------------------

      7  8  9  13

      4  5  6  12

      1  2  3  11

     14  Ø 15  1Ø

     * = CHR$(13)

     £= CLEAR SCREEN

     SYSnnnn TO ENABLE

---------------------
```

Figure 1. First KBASIC screen

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6. The list of keypad keys and their initial values are displayed next. The key number is shown on the left and the current value is shown on the right. The following prompt is displayed:

```
(E)NABLE & EXIT
(C)REATE NEW VALUES
(L)OAD NEW VALUES
```

* To use the key values shown, enter E. The KBASIC program then loads a machine-language program which reads the keypad input, then KBASIC removes itself from memory.

* To change the key values, enter C. Continue at step 7.

* To load a set of previously-defined key values from a file, enter L. Continue at step 9.

7. The keypad keys are again displayed with their current values. This prompt is displayed:

```
16=STORE AND EXIT
17=EXIT
ENTER # TO CHANGE
```

To change a key's value, enter the key number (shown on the left). The map of key numbers is shown in Figure 1. (Use the keyboard, not the keypad, to enter the key number.)

The current value is then displayed on the bottom line of the screen, followed by a "?". Enter up to eight characters to be used as the key value. To keep the current value,press RETURN.

* To save space when entering BASIC statements (remember you are only allowed 8 characters for each definition) use the abbreviations. (The abbreviation for BASIC keywords are listed in your Commodore instruction manual.)

* The English pound character (next to the CLR/HOME key) can be entered as a "clear screen" character.

* The back-arrow (next to the CNTRL key) can be entered as a "RETURN" character.

After you enter all the desired key values, you can store the set in a file on disk or cassette by entering 16; continue at step 8. To use the values without storing them for later use, enter 17; continue at step 9.

8. If the file of key values is to be stored on cassette, remove the cassette containing the KBASIC program. Next, load the disk or cassette which is to contain the file. You now will be prompted for the file name with this question:

ENTER NAME OF KEY FILE?

To return to the main menu without creating a file, enter the ampersand (at sign) character (next to the P key). Otherwise, enter the file name, then follow the instructions displayed. The file of key values is then stored; next, the current key values are displayed. Continue at step 10.

9. If the file is to be loaded from cassette, remove the cassette containing the KBASIC program. Next, load the disk or cassette which is to contain the file of key values. You are then prompted for the file name with this question:

ENTER KEY FILE NAME TO LOAD?

To return to the main menu without loading a file, enter the "at" character (next to the P key). Otherwise, enter the file name, then follow any instructions displayed. The set of key values is then loaded and displayed. Continue at step 10.

10. After you've created or loaded the desired key values, enter E to start the machine-language program and to end the KBASIC program.

11. You can now use the keypad to enter whatever numbers, signs, program statements, or symbols you defined. You can also load another program from disk or tape, and then use the keypad for inputting data to that program.

DO NOT use any BASIC POKE statements to change the contents of memory from the top of BASIC to 304 bytes below the top. That is where the machine-language program is stored.

12. After you've finished using the keypad, you can either leave the machine-language program in memory or remove it. To remove it, turn the computer off and back on.

USING CARD/CALC
****

The CARD/CALC program is used as a four-function calculator with memory. The CK/1 Keypad is used with CARD/CALC just like a 10-key calculator. It has some nice features not found on calculators, however, as follows.

* You can print both the numbers you enter and the running total.

* You can use either fixed-point or floating-point numbers. Fixed-point numbers in this program have two decimal places; they are especially useful for calculations concerning money. Floating-point numbers have up to nine decimal places; they are especially useful for scientific and engineering calculations.

* The contents of memory are displayed. You don't have to remember (or guess) what you stored in memory.

* The last number entered is stored, and can be used without being entered again. To use it, you just enter the sign of the calculation to perform on the number. For example if you want the to raise 4 to the fourth power (4 X 4 X 4 X 4) all you need do is press 4, then press the times sign key four times.

The KBASIC program must be run first when the keypad is to be used to enter numbers for the CARD/CALC program. CARD/CALC can also be run using the numbers on the top row of the

keyboard instead; when this is done, KBASIC does not have to be run. If the CK/1A Keypad Adapter is used, the keypad can be used like the keyboard numbers, without running KBASIC. (For details on ordering and using the adapter, see the "KEYPAD ADAPTER" section of this manual.)

To run CARD/CALC using the keypad for input, perform the following steps. (An example of using CARD/CALC is shown in the Appendix.)

1. Unplug any joystick or game paddles being used, then plug the keypad into the joystick port. (It is the port on the right end of the computer, labeled "Control Port".)

2. Load the cassette containing the KBASIC and CARD/CALC programs. One side of the cassette contains the programs for the VIC-20, and the other contains programs for the Commodore 64. Be sure the side containing your computer's programs is facing up. Enter LOAD to load the KBASIC program.

3. When READY is displayed, enter RUN to start the KBASIC program.

4. When the KBASIC program is started, enter E to use the initially displayed key values. KBASIC loads a machine-language program into memory and then removes itself from memory.

5. Enter LOAD to load the CARD/CALC program into memory.

6. When READY is displayed, enter RUN to start the CARD/CALC program.

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7. When the program is started, the title is shown on the top line, followed by the programmer's name and the version number. You'll also see FL in the left corner; that means that the current number mode is floating-point. The rest of the screen is dark, except for a "less-than" character near the center of the screen. That character is the point where new numbers are entered, and has no other significance.

8. The program is ready to use. Start entering numbers and signs just like you would on a calculator. (Enter the number first, then enter the sign of the calculation to be performed on the next number entered. (For example, to add two numbers, you would enter the first number, then the plus sign, then the second number, then the ENTER key.)

The entered numbers are displayed in the dark part of the screen, while the running total is displayed on a light line below the entered number.

There are a few differences from a regular calculator, as follows:

* For multiplication, the "*" character is displayed and printed rather than the usual multiplication sign.
* For division, the "/" character is displayed and printed rather than the usual division sign.
* The calculation sign is displayed and printed on the right side of the numbers. (The minus sign of negative numbers is shown on the left of such numbers.)

OTHER FUNCTIONS

There are some functions available other than those on the keypad. Such additional functions include change sign, clear-all, memory operations, and others. The keys used for these other functions are shown in Figure 2.

Function	Key
M+ (add to memory)	f1
M- (subtract from memory	f3
MR (recall from memory)	f5
MC (clear memory)	f6
change sign key (+/-)	f7
equals or total	ENTER or RETURN
clear entry (last digit)	DEL
clear all (but not memory)	HOME
fixed-point/floating-point	F
start/stop printing	P
end the program	STOP and RESTORE

Figure 2. Keys for program functions

PRINTING ENTRIES AND TOTALS

You can print the numbers you enter and the running total. To turn on the print function, make the printer ready, then press P. When the print function is on, a P is displayed on the third line of the screen. The numbers are printed in this format:

number / calculation / total

To turn off the print function, just press P again. The P key is a toggle switch that will turn the printer on if it is off or off if it is on.

FIXED/FLOATING POINT CALCUTATIONS

The F key is the toggle that shifts between the FIXED and FLOATING POINT modes of operation. When you are in the FIXED POINT mode the word "FIXED" will be displayed on the third line of your display. All calculations in the FIXED POINT mode are rounded off to two decimal places.

In the FLOATING POINT mode the word "FLOAT" is displayed on the third line of the screen. In this mode all calculations are carried out to the full capability of the system's 8 significant digits.

USING MEMORY

You can use the memory function to store numbers for use in later calculations or to store intermediate totals. The brown function keys on the right side of the computer keyboard are used for memory functions as shown in Figure 2. The contents of the memory are lost when the CARD/CALC program is stopped. When you put a number in memory, the memory contents are displayed on the third line of the screen. This is rather handy because you don't have to remember what number(s) you have in memory.

REPEATED CALCULATIONS

When a number is to be repeatedly used, you can enter it once, then press just the desired sign key as many times as needed. Each time you press a sign key by itself, it performs the calculation on the last number entered.

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APPENDIX

This section of the manual contains an example of running the KBASIC program to define the keypad keys as BASIC statements, and of using the keypad to enter a BASIC program. A template you can use for key-value reference is also included for your convenience. At the end of this section is an order form for the CK/1A Keypad Adapter.

EXAMPLE: RUNNING KBASIC

This example of the KBASIC program shows how to define the keypad keys as BASIC statements. The same principles, though, are used to define the keys as other values.

Load and start the KBASIC program, and wait for this message to be displayed:

```
(E)NABLE & EXIT
(C)REATE NEW VALUES
(L)OAD NEW VALUES
```

To define different key values, enter C. The key numbers and current values are displayed again on the next screen, with these additional messages:

```
16=STORE AND EXIT
17=EXIT
ENTER # TO CHANGE?
```

(If you need to, refer to Figure 1 to see which key numbers are assigned to what keys.) In the list displayed, the number on the left is the key number; the data on the right is the key value. Start by entering 14. (Use the keyboard to enter things now, not the keypad.) A ".?" is displayed on the bottom line. This is the current key value (a ".") followed by a prompt (a "?") for the new key value.

Enter the BASIC keyword GOTO followed by the number 1Ø and the back-arrow character (next to the CTRL key). When you press RETURN, line 14 (the value of key 14) shows 14 =GOTO1Ø. Later, after you enable and exit KBASIC, the statement GOTO1Ø is entered whenever you press the "." key (key 14) on the keypad.

Now that you have the basic idea (pun intended!), define some other key values as follows.

* Enter 1Ø to define key 1Ø's value. When the current value and "?" are displayed on the bottom line, enter PRINT.

* Next, enter 11 to define key 11's value. When the "?" on the bottom line is displayed, enter the word HELLO.

* Enter 12 to define key 12. When the "?" is displayed, enter a pounds sign (next to the HOME key). The pounds sign is used as a CLR character.

* Now, enter 17 to return to the main menu. (Don't worry about saving the values in a file.)

When the main menu (ENABLE & EXIT, etc) is displayed, enter E to start the machine-language program (thereby enabling the keypad) and to stop KBASIC. After a few seconds, READY is displayed. You are now ready to enter a BASIC program using the keypad. (Be sure to plug the keypad in now.) Hold on tight -- here we go!!!

EXAMPLE: ENTERING A BASIC PROGRAM

Perform the steps in the preceding example before doing this example.

* Press the 1 and Ø keys on the keypad, but don't press ENTER or RETURN. You have just entered the first line number.

* Press the "+" key (key 1Ø) but not the ENTER or RETURN keys. PRINT is displayed next to the line number. You have just entered the first BASIC keyword.

* Enter a double-quotation mark (") from the computer keyboard.

* Press the division-sign keypad key (key 12). The reverse-heart sign is displayed next to the PRINT statement.

* Enter a double-quotation mark (") from the computer keyboard, then press ENTER or RETURN. You have just entered the first complete BASIC program line! This line causes the screen to be cleared.

* Press the 2 and Ø keypad keys to enter the next line number.

* Press the "+" keypad key again to enter the PRINT keyword.

* Enter a double-quotation mark (") from the computer keyboard.

* Press the "-" keypad key (key 11). The string HELLO is displayed next to the PRINT statement.

* Enter a double-quotation mark (") from the computer keyboard, then press ENTER or RETURN. You have just entered the second BASIC program line. This line prints the word HELLO.

* Press the 3 and Ø keypad keys to enter the third line number.

* Press the "." key (key 14). The BASIC statement GOTO1Ø is displayed. You have just entered the third and final BASIC program line!

Now, run the program by entering RUN on the computer keyboard. See, the program actually works--believe it or not! (At least, it SHOULD BE flashing HELLO on the screen...)

At this point, you should be able to 1) run KBASIC to define key values for programming language keywords (and variables) you commonly use, and 2) use the keypad to enter programs quickly, easily, and with few typing mistakes.

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HELPFUL HINTS
****

* Use the language keyword abbreviations whenever possible. By doing so, you can get more characters in a key value definition than you could if you spelled out the keywords. (Remember, a key value can be a maximum of eight characters.)

* Although the number keys were not assigned different values in the example, they can be if you desire. When you are entering program lines containing line numbers, however, it is handy to leave the number keys assigned as such; you can then enter the line numbers from the keypad (like was done in the example).

KEYPAD KEY-VALUE GUIDE
****

Cut out this template, fill in the boxes with the key values you assign, and use it as a reference when you are using the keypad.

7	8	9	X
4	5	6	(division)
1	2	3	-
.	Ø	enter	+

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KEYPAD KEY-VALUE GUIDE

Cut out this template, fill in the boxes with the key values you assign, and use it as a reference when you are using the keypad.

7	8	9	X
4	5	6	(division)
1	2	3	-
.	Ø	enter	+

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